DOCUMENT RESUME

ED 037 163 HE 001 371

AUTHOR	Miller, Stuart
TITLE	Measure, Number, and Weight: A Polemical Statement of the College Grading Problem.
INSTITUTION	Michigan Univ., Ann Arbor. Center for Research, Learning and Teaching.
PUB DATE	Mar 67
NOTE	36p.; A study prepared for the Academic Senate Select Committee on Education, University of California, Berkeley, Summer 1965
EDRS PRICE	EDRS Price MF-$0.25 HC-$2.00
DESCRIPTORS	Achievement Rating, *Evaluation, *Grades (Scholastic), *Grading, *Higher Education, *Pass Fail Grading

ABSTRACT

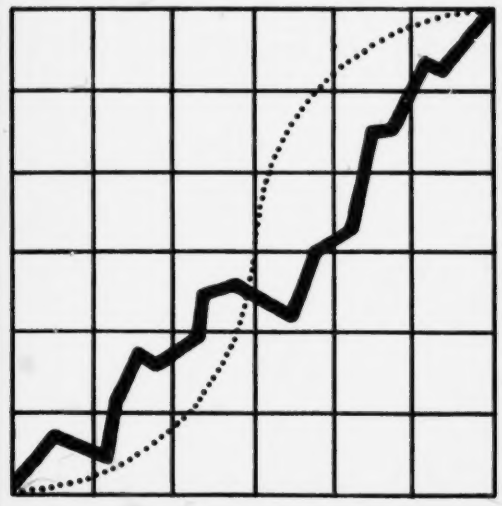
The following advantages are regularly cited for traditional grading: it is in common use and allows relatively standardized information about students; it enforces academic discipline; it serves numerous administrative purposes; it prepares students for the competitions of life; it motivates students; and it is a fairly reliable index of academic achievement. The disadvantages far outweigh the advantages, however. These include: the inaccuracy of traditional grading; its deleterious effect on the teaching situation, learning, and creativity; and its ineffectiveness in stabilizing the academic standards of the university and in motivating students. In addition, there is substantial evidence to indicate that grades badly serve the purpose of determining graduate admission; that transferring and hiring can be done without grades, and that the grading system has no counterpart in real life. The author proposes consideration of several variations of the pass-fail system, or, as an alternative, a system of comprehensive examinations combined with written reports on the student. (AF)

ED037163

Center for Research on
Learning and Teaching

The University of Michigan

March 1967



U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED037163

PREFACE

I compiled this study for the Academic Senate Select Committee on Education, University of California, Berkeley, during the summer of 1965. It will be apparent to the reader that the examples taken from Berkeley are nearly always applicable to conditions on any large campus.

Let me use this opportunity to thank some of those who helped me: Miss Patricia Miles for her typing; Miss Linda Reeder for help in preparing the final manuscript. Special thanks are due to Miss Judith Rypins, my graduate assistant on the project, and Mr. Charles Muscatine, then Chairman of the Select Committee. Miss Rypins' assistance allowed me to double my own efforts; Mr. Muscatine's guidance helped give those efforts focus.

Stuart Miller
Livingston College
Rutgers · The State University
New Brunswick, New Jersey
December, 1966

FOREWORD

The Center for Research on Learning and Teaching is pleased to receive permission to reproduce this report and to make it available to a wider audience on our campus and elsewhere. Professor Miller has brought together many of the pro and con arguments about the pass-fail grading system, but he does not try to conceal his own preferences. While the issues are complex, fuzzy, and often toned with strong feelings, they must be carefully considered by teachers and students since, for right or wrong, grades continue to serve as the major criterial measure of academic achievement.

Stanford C. Ericksen
Director, CRLT

CONTENTS

Foreword		i
Preface		ii
I.	Arguments for Retaining the Present System of Grading and Examining	1
II.	Arguments for Changing the Present System	4
	A. Accuracy of Grading	4
	B. Grades and the Teaching Situation	7
	C. Grading and Academic Standards	9
	D. Grading and Motivation	10
	E. Grading and Graduate Admissions	12
	F. Grades and Transfers	14
	G. Grades and Employment	14
	H. Grades and the Battle of Life	14
	I. Grades and Honors	18
	J. Grades and Creativity	19
	K. Summary of Arguments Against the Current Grading System	21
III.	Some Proposals	22
	A. Pass-fail Grading	23
	1. Minor Enlargement of the Pass-fail Option	25
	2. Pass-fail in the Breadth Requirements	25
	3. Pass-fail in all Nonmajor Courses	26
	4. Pass-fail in the First Two Years	26
	5. Pass-fail in All Four Years	26
	B. Comprehensive Examinations	27
	C. Recommendations	29
	D. The Dossier	30
	E. National Cooperation	30
References		31

> thou hast ordered all things in measure, number, and weight. For it is always at thy command to show thy great strength; and who shall withstand the power of thine arm?
>
> Wisdom of Solomon, 11:20-21

I

ARGUMENTS FOR RETAINING THE PRESENT SYSTEM OF GRADING AND EXAMINING

The system of examining and grading in the American college is largely standardized as follows: grades of A, B, C, D, and F, together with a number of special grades like Pass and Incomplete; the grade-point average, calculated on a 4.00 system, determining whether a student qualifies for remaining in the university and for various honors; and instructor-written examinations and other graded assignments. A survey done by the University of Idaho and my letters of inquiry to some eighty colleges and universities leave no doubt that this is the most common system, at least among the better known and higher quality institutions.

The system's greatest recommendation is its administrative efficiency. While everyone knows that there is tremendous variation in the "worth" or meaning of an A at one college and an A at another, the relative standardization of the grading system allows an easy evaluation of students who wish to transfer between institutions. Letters to graduate departments of several universities indicate an extreme reluctance on the part of administrative officers to give up this benefit of the standard grading system. While a grade-point average of 3.32 from one school may not be worth more than 2.46 at another, over the years a graduate admissions officer can develop a formula for the discrepancy and so determine the relative meaning of a given grade. When Bennington College ran a survey of thirteen graduate schools some years ago, giving them a transcript with comments on students, but no grades, six replied that they could do the job, albeit they would have various difficulties with the Bennington system. One institution did not reply. The other six indicated they just could not operate without the grades.

Not only is there the widespread belief that grades are an administrative necessity in the matter of transfer from institution to institution, but, according to many they are valid predictors of future academic work. Arvo Juola (1961, p. 313) writes:

> Despite the diverse grading practices of different schools, differences in ability levels among the schools, differences in quality of instruction among the schools, and the general unreliability of grades, no better generally applicable indicator has been uncovered. This superiority probably results from the nonintellectual factors reflected in grades at both levels as well as from the dependence of college work on previous achievement.

Replies to letters of inquiry to graduate schools indicate that college grades are the best single index to graduate school performance, but there are no studies corresponding in quality or quantity to those made correlating high school and college grades. It is hard to say whether the widespread impression that college grades correlate with graduate school grades is correctly held or not. There is some evidence to show that college grade differentials above B (3.0) have little correlation with the chances of a student's getting a Ph.D. (Stark, 1966).

Despite many complaints about the unreliability of college grades in separating the good student from the bad, Benno G. Fricke (1965), Chief of the Evaluation and Examinations Division of the Bureau of Psychological Services at The University of Michigan, writes:

> It seems to me that evidence collected locally and nationally indicates that an instructor usually does a good job of identifying the most and least proficient students in his class. Although use of alternate or improved assessment devices and procedures would occasionally make significant changes in the rank-order of some students, there is reason to believe that, in general, students in a particular class would be ranked similarly by different but equally qualified instructors.

Though Fricke has reservations, particularly about the diversity in the number of A's two different instructors might give in a class, he is firm in his basic belief in the justice of the typical grading system. Many college instructors, particularly in the sciences, are also convinced that the grading system is quite accurate as presently administered.

Many businesses, including nontechnical ones, find the present grading system useful. Employers who come to the University of California to interview students often request a transcript of courses and grades. Furthermore, the American Telephone and Telegraph Co. has detected a low but significant correlation between the final salaries their employees reach and their college grades (Kappel, 1962, pp. 8,18).

Proponents of the present system have other arguments besides those of administrative convenience and accurate measurement. To the argument that grades are inaccurate and also corrupting precisely because the student has to adjust to the ideas of each separate professor who grades him, many answer that this adjusting is a good thing: "Students learn to accustom themselves to the ideas of different professors.... In striving for grades they adapt themselves to certain requirements, thereby learning to analyze the basic problems of the course." Such behavior, Professor Lawrence A. Harper argued in the Daily Californian for March 2, 1942, would lead to clear-thinking. Those in agreement with Professor Harper would add that grades are pedagogically useful in enforcing attendance and other types of discipline and in motivating the student to work in any course.

Though it has often been said that grades foster an attitude of competition that is at variance with the idea of a university, many view the competition arising from the grading system as a positive pedagogical

value, a positive preparation for life. Virgil K. Whittaker, Dean of the Graduate School at Stanford University, writes:

> I think it a disservice to students who will spend their lives in a highly competitive society to try to shield them from the fact of competition during an important formulative period of their lives. . . . any attempt to pretend that we do not rank students is intellectually dishonest.*

And Luther D. Evans (1942, pp. 57-59), writes:

> Think of grades and marks as you will, they do remind the student that he lives in a world of competition. . . . A student who completes a program of higher education without facing the rigorous evaluations of a grading system has missed one great chance to learn the helpful lesson that life is full of tests and trials.

Some of these considerations were responsible for the introduction of the grading system at various schools. Wilfred B. Shaw (1934) quotes George Wahr who says that for many years Michigan had only pass-fail grading. He agrees that this may have stimulated study for its own sake, but thinks it also encouraged a certain mediocrity. Professor R. Connick of the University of California at Berkeley's College of Chemistry writes:

> The change in the system of marking and the introduction of Phi Beta Kappa in 1907 resulted in a marked alteration in the attitude toward study and undoubtedly raised appreciably the general level of scholarship on the part of the students.

Though concern has been expressed repeatedly about students wanting to earn grades rather than to learn, some feel that what the student does is up to him:

> It is my understanding that there is concern that the students attach too much importance to the grades and too little to what they learn. It seems to me that this is very much a matter of personal choice by the student. As far as staying in the University is concerned, there is a tremendous range of performance which is permissible. I find it hard to believe that any student who is really working in his courses is in danger of flunking out.**

Grades presently serve an enormous number of administrative functions that are nonacademic or only partly academic: they allow the college to determine and enforce minimum academic standards; to distribute scholarships with some degree of equity; to determine the award of academic honors such as Phi Beta Kappa, the admissions to honors programs, and so forth; to determine the award of nonacademic honors such as fraternity memberships, and the like; to determine athletic eligibility; to help the faculty advisor get a picture of his students' achievement for the purpose of advising; and so on. There are those who would argue that these administrative functions are badly served by grades; but the proponents of the present system, while

---

* Letter dated August 9, 1950.

** Letter dated August 16, 1965.

admitting that it is not perfect, would argue in return that no better system yet exists which can be adapted to the situation of a large institution. This is a potent argument indeed and one which requires for its answer the expenditure of much money, time, and intellectual energy—for, otherwise, no alternative system can seemingly be devised.

To sum up the arguments for the present system: it is in common use and allows relatively standardized information about students to be interchanged between schools; it enforces academic discipline; it serves numerous administrative purposes both within and without the grading institution; it prepares students for the competitions of life; it motivates students to work; it is a fairly reliable index of academic achievement. These arguments are so powerful, and generally so well known, that there is little point in rehearsing them further. Any change in the present system must take them into account.

II

ARGUMENTS FOR CHANGING THE PRESENT SYSTEM

A. ACCURACY OF GRADING

Professor: What did you get out of the course?

Student: I got a B.

* * *

"Marks and terms are clumsy devices, more suitable for measuring cordwood than culture."

David Starr Jordan (1929, p. 30)

While many people in higher education will defend the present system, few would say it is perfectly satisfactory. A study done by Robert C. Birney (1964), Professor of Psychology at Amherst College, reports that students think grades indicate too little about ability and potential. They feel the need for extensive comments from their instructors instead of mere letter grades. Students always consider their grades too low. They find the system too capricious and variable.

Many professors will admit the validity of these complaints. But many others would argue that they are exaggerated. In one sense the accuracy of the students' complaints about the arbitrariness of grading in each course is not important. It is not so important, surely, as the fact that many students believe that the standards in most courses are not objective; they believe that in order to get good grades it is necessary to

cater to the specific prejudices of the individual professor; they complain that the grading system forces them into dishonesty both intellectually and in other ways; they claim that the regulative notion governing student conduct at college is not the pursuit of knowledge but playing the game. And they would say that the argument that a student does not have to play the game in order to remain in college leaves out important elements in the situation. Though a student can remain in school without becoming a "grade grubber," can he get into graduate school? Can he get graduate fellowships? They would be inclined to say that generally he cannot.

The students concluded that grade grubbing is essential, that the active pursuit of grades rather than learning is essential if a student is ambitious for material rewards after college. They also concluded that much of that grade grubbing has nothing to do with intellectual achievement. They complain that they are going to school to learn how to put on a face to meet the faces that they meet; and they argue that if this is a preparation for life, it is a kind of preparation they did not expect to get in the university, of all places.

Even if the students are wrong in their assumption that professors must be manipulated if a student is to get good grades, the fact that the students believe this to be the case is important. Their attitude distorts the teaching situation enormously.

Unfortunately, there is considerable evidence, compiled at all grade levels in the American educational system, to indicate that the students are not wrong in assuming that grades are often contaminated by nonacademic variables. Paul Dressel and Clarence H. Nelson (1961, p. 232) write that a widely recognized problem with grading is the disagreement in actual fact about what a grade really measures:

> ...absence, bad attitude, nonparticipation in class, and the like are considered by some teachers behavior contributing to a low grade. Grades can be and are used as a weapon to enforce temporary student conformity to prejudices of the teacher. These prejudices may have justification in the content and methods of the course, but they also may be purely personal and irrelevant. The case of an excellent student who was failed because his instructor disliked his attitude comes to mind. The inclusion of such personal, intangible, and often unspecified elements in grades makes their meaning unclear. Unfortunately, this very uncertainty causes students to focus on grades more than they otherwise would. We are all preoccupied by the uncertainties in our lives.*

---

* The Committee on the Teaching of Botany in American Colleges and Universities of the Botanical Society of America (1938, p. 33) noted: "Pleasing personal behavior, self-assurance, apparent interest and enthusiasm on the part of the student may sometimes be mistaken for achievement in the course; unattractiveness, timidity, and an apparent indifference for the lack of it. Objective impersonal evidence of student achievement is needed." This is particularly interesting in the light of claims to a greater degree of objectivity in their grading by those teaching in the sciences. It is possible that such objectivity exists, but apparently only in a greater degree at best. Testimony that leads one to the same conclusion comes from a paper written by William G. Perry, Jr. (1963, pp. 125-135) for the Bureau of Study Counsel, Harvard University. Perry reports that at least one student of "considerable talent" gave him an "impressive analysis of the art of amassing 'partial credits' on examinations in advanced physics. Though beyond me in some respects, his presentation confirmed

Though Dressel and Nelson (1961, p. 251) conclude that "Grading is inevitable," they go on to say "it is, at best, inaccurate and unreliable." In the same book, Osmond E. Palmer (1961, p. 208) notes, "Studies have shown that an instructor does not usually give the same grade to a paper when he rereads it after an interval of time without knowing his previous grade," a potent argument for leaving only an analytic and evaluative comment on a paper and no grade.*

There are hard and easy instructors, but the differences are often grotesque: A study done by B. C. Kirby (1962) at San Diego State College, on the grading done by 206 instructors in lower division showed that the median grade varied between 1.82 and 3.88. Among 179 upper division instructors, the median grade varied from 1.97 to 3.71. Recent studies of departmental grading at Berkeley indicate similar results. A. B. Crawford (1930) noted wide variation in grades given by different departments and by inexperienced vs. experienced instructors in a study done on Yale freshmen from 1922 to 1927. Interestingly enough, the more experienced instructors gave a much wider distribution of grades, probably because these men felt greater confidence in their judgment. Nor is the belief that grades are given on an absolute scale of some sort valid: Lewis R. Aiken (1963) has shown that whatever teachers may think, they usually grade with reference to the existing ability of their students; they curve their grades. That is to say, in any given class most professors, consciously or unconsciously, have more or less limited the number of A or D grades before they have met the class.

C. H. Haagen (1964), registrar for Wesleyan University, has catalogued some of the variables that may affect the grading of an instructor:

(1) The instructor may be grading on the development of the student's mind, or on his originality, or on his conformity. Presumably, the students are able to find out with relatively constant success just what is being called for, but such variation does not encourage their allegiance to the institution. The question "What does he want?" is heard all too frequently in student circles, and students are all too willing to give "him" what he wants.

(2) The instructor may not clearly define the objectives of the course.

(3) Methods of teaching vary among instructors as to how much scope is allowed for the student's particular strengths.

---

my impression that instructors of physics frequently honor on examinations operations structurally similar to those requisite in a good essay." Perry's conclusion is that it is possible to "bull," as he puts it, in advanced physics as well as in English. One might argue that in advanced physics grading an examination may not be the open-and-shut matter it is often thought to be, and as in English, what one professor takes as ingenuity on an essay another may take as stupidity.

* In a letter to the Select Committee, William K. LeBold, Assistant to the Dean of Engineering at Purdue, writes, "I think it can be demonstrated that grades in individual courses are often rather unreliable."

(4) Instructors may or may not exercise accuracy of observation.

(5) Instructors' standards of comparison range from some absolute criterion of perfection and mastery of a subject, to a rigid curve.

(6) The personality of the instructor may be sympathetic and constructive, or prone to personal biases, or lenient because frightened of students, and so forth.

There is also some evidence to suggest that students are right in their assumption that sex may influence the grade in a course. Charles A. Many (1933) discovered in a study of marks given by six instructors at Transylvania College for ten years (1921-31) that three of the six instructors "failed to mark the women as consistently in accord with the marks given by all the faculty as they marked the men." This does not mean that the women got higher or lower marks, though in fact all six instructors gave higher averages to the women. Mancy says:

> It means simply that the grading of the women was not as objective as the grading of the men. It may be stated that sex-bias appears as an important factor interfering with objectivity in the marking of college students. This finding may be regarded as suggestive of what is true in colleges and universities generally.

Eldon G. Kelley (1958) concluded that femininity was an influence on grades; he compared the instructor ratings of students with the student scores on end-term exams. Women received both higher instructor grades and higher exam grades than the men. While women's exam grades were only slightly higher than the men's exam grades, women's instructor grades were substantially higher than the men's.*

B. GRADES AND THE TEACHING SITUATION

Perhaps the most eloquent protest about the effects of teacher-assigned grades on the teaching situation comes from Joseph J. Schwab (1954).

> The work cannot, by the farthest stretch of the word, be called willing when it is done perforce under the whip of an imminent inquisition. It cannot be called independent when it must meet a test arbitrarily set by the same man who sets the work.... It is fair to say that ingenuity could not combine the inimical effects of bread-and-butter love and submission to the taskmaster and inquisitor more effectively than does the institution of the teacher-set examination. Without its removal, the possibility of establishing a sound teaching relation with the vast majority of students is well-nigh nil.

It is fair to say that many of our most dedicated teachers share Schwab's view of the effects of the grading and examining system on the teaching situation. According to them, the relationship of teacher to student is a

---

* See also Singer (1964). Singer's very amusing study of a large group of students showed a significant correlation between the qualities of manipulativeness in men and attractiveness in women and grades. Other variables were controlled.

relationship of love. The place of an impersonal rating system in such a situation is hard to imagine. Even the best of our teachers, while admitting that it is possible to get the students to care about the subject rather than the grade and that one can overcome the alienation of student from teacher which the grading system generates, yet complain that to create a sound teaching relationship with this much working against them is at best very difficult and at worst only occasionally possible. They claim that too much energy is wasted in winning the student over, energy that could profitably be better directed in the classroom. They see the present system of teacher-set examinations and teacher-administered grades as a hindrance to teaching.

Some critics of grades claim that the reason many professors are reluctant to listen to proposals for eliminating the system or changing it is that they would be afraid of dissent in the classroom. Some critics say that professors themselves tend to be types who have been successful in school; that success in school has a high relation to conformity according to the psychologists; and that our faculty conformists are afraid, consciously or not, of allowing their students to be nonconformists. These arguments come from faculty as well as students. Max S. Marshall (1952) notes that grades have the effect of herding students into following the teacher's path, and making teachers authoritarian and uncooperative toward their students.

A similar objection to the effects grades have on teaching was voiced by Paul Heist (1965) of the Center for the Study of Higher Education at Berkeley. He noted, "The development of the individual to the fullest extent possible is, of course, the most appropriate educational goal in a democracy." In an interview he said that the present grading system is too monolithic. It fails to encourage diversity by taking account of the valuable variety of qualities in our undergraduates. One of the things grades do, he noted, is encourage conformity, erecting one norm of academic performance and direction for all.

Some of the tensions that may develop in the teaching situation because of grades may well be beyond the imagining of many teachers. For example, a survey done by Paul Heist at a distinguished college we are not at liberty to name found students, as at Berkeley, complaining of a distance between faculty members and themselves. And yet four freshmen in the top twelve percent of the class according to the grade-point average complained that they felt unable to visit professors for fear of being accused (whether by the teachers or by themselves or by their peers, is not clear) of "grade-grubbing." Some critics of the grading system infer from this type of observation that enough students cultivate faculty members to exploit personal contact for grades that the more sincere students fear falling under the same accusation if they should take advantage of opportunities to get to know and get help from their professors. The students we consulted at Berkeley agreed with these inferences, and added that the pressure for grades increases the problem: only the most aggressive students, and perhaps often the less honorable ones, make use of faculty office hours.

Other complaints about the grading system have less to do with the teaching situation itself than with the educational situation as a whole. Mervin Freedman (1964) sees the American men's college encouraging

a definition of success as "academic and later business or professional success; and achievement of this kind is becoming the sole standard by which middle class boys and young men evaluate their worth and self-esteem." He sees the grading system as a vital part of this process, encouraging this whole set of values, devaluing personal excellence and achievement apart from academic or vocational success. As enforcer of the work-success ethic, the grading system allows no time for creative leisure. Freedman notes that it is possible that students

> have absorbed this slave mentality and made it a part of themselves. Students are uncomfortable, unless they are working hard or being overworked. There are those who would argue that the colleges are participating willy-nilly in the pressurized system of grading that begins with pre-school—trying to do well in order to eventually get into a good college and be 'successful.'

Freedman's article serves those who criticize the grading system as a perspective from which they can ask the question, "What are the long-term educational effects of our grading system?" Are we not encouraging the conformity which is the constant complaint of American social critics? Are we not robbing the student of the leisure traditionally associated with the university in its European cradle? Freedman argues that what is needed in our society is "originality, not conformity; dissent not compliance—reasoned dissent, of course, not blind rebellion—but dissent nonetheless."

C. GRADING AND ACADEMIC STANDARDS

One of the arguments for keeping the present, highly articulated grading system, or substituting one much like it, is that it stabilizes academic standards. However, this has frequently not been the case. At Berkeley, for example, as the quality of entering students has improved their grades have remained the same. Here are the figures:

College of Letters and Science	Verbal SAT	Math SAT	H.S. GPA	U.C. GPA
Male, 1947	491	508	3.32	2.34
Male, 1960	557	595	3.45	2.34
Female, 1947	483	411	3.40	2.34
Female, 1960	543	518	3.51	2.34

In both 1947 and 1960 all freshmen who matriculated on the Berkeley campus sat for the Scholastic Aptitude Test of the College Entrance Examination Board. Their SAT scores, as well as their grade-point averages in the tenth, eleventh, and twelfth grades, and in the first semester at the University, were compared

as part of "A Review of CEEB Entrance Testing at the University of California, 1947-1963," done by the University's Office of Educational Relations. As the quality of entering freshmen increased from 1947 to 1960, did the motivation of those students decline?

Information coming from other universities also indicates that grades have not risen in proportion to aptitude. In this light the "stability" of academic standards seems highly illusory. One begins to wonder whether grades either stabilize or enforce academic standards.

D. GRADING AND MOTIVATION

> Those individuals who consider that the prime road to advancement of culture and knowledge consists in unswerving application to study and competition among students might well ponder the circumstances of one of the most important scientific discoveries of all time made by one of the most creative men who has ever lived. I refer to Isaac Newton...and the discovery of gravitation. The discovery took place under a tree. At the time he was sitting idly in his mother's garden. He was not at Cambridge, was removed from traditional learning, because in that year, 1665, the plague had broken out in southern England. The University of Cambridge was closed for eighteen months. We know from Newton's account, told in his old age, what his state of mind was at the time of his discovery. He described himself as in an eager, boyish mood. "I was," he said, "in the prime of my age for invention." An eager, boyish mood in a young man not at school but idling in a garden led to a great scientific advance. How unlike the mood of most American college youth (Freedman, 1964).

John L. Goodlad, Professor and Director of the University Elementary School at UCLA contradicts the notion that grades do motivate students:

> In the laboratory school which I direct here at UCLA, the children do not at any time experience the so-called normal curve system of rating. They do not receive grades for anything and they are in a nongraded school in the sense that there are no demarcations such as the first grade....There is no evidence whatsoever to suggest that these youngsters are any less motivated than youngsters in a graded system, A to F. I take the position very firmly that the only meaningful reward in learning comes from learning itself and that all of these external rewards serve to contaminate the process.*

The article by Robert C. Birney (1964) notes that the subject of how grades serve as an incentive is very complex and badly in need of further investigation. He reports, however, that failing or near-failing grades produce great effort in the student, but that with higher grades, the effect is unpredictable. Often a student's interest in the course becomes the big factor in how much work is done. In a course of little interest, high grades lessen the amount of study. Generally, the grade achievement is not closely related to the student's interest in the course, or his evaluation of the importance of the subject. The grade aspirations of students as

---

* Letter to the Select Committee dated August 4, 1965.

a factor in achievement have hardly been studied at all, but Birney tentatively concludes that high achievement grades may induce pessimism and cynicism. The student who has attained high achievement feels that any increment in grade aspiration only involves more effort, more politicking, more anxiety. Students also often have a level of satisfaction: one may take himself as a B student, the other as a C, and each will be content when the grade level is achieved.

As for the effect of low grades on bright students, Paul Heist, in a report prepared for a distinguished college on its grading problems, notes that studies have indicated quite varied reactions. Some students work harder, others do the opposite, and for some the effect of low grades is neutral. Speaking of the bright students who work less when punished by low grades Heist says, "The reactions or 'mechanisms' resorted to are sundry and diverse, and for some these reactions lead to the first obvious steps toward a form of underachievement or 'beating the system' (and themselves)." Heist goes on to question the motivational effects of grades in a large context: "With feelings of uncertainty, confusion, and fear, and/or with negative attitudes toward an instructor, it is quite likely that a great deal of class time is a complete waste. An evaluative system should not worsen the learning environment but serve the students' needs and development."

Joe L. Saupe (1961, p. 60) writes:

> Although the experimental evidence is slight, it appears safe to say that the intrinsic motivation is to be preferred to extrinsic in promoting efficiency in learning. If the student's goal is to satisfy the teacher, he may do so, but he may learn course material only casually and incidentally. On the other hand, success in activities motivated intrinsically leads not only to desired learning outcomes but also to further engagement with these types of activities.

In the same book, Dressel and Nelson (1961, p. 233) call attention to the disparity between the teacher's motivation and what he makes the motivation of the student:

> Examinations and the grades derived from them should not entirely determine the amount and the kind of work that students do. The monthly pay check is the most obvious reward of the teacher, but personal satisfaction and other less tangible elements combine to motivate him to an effort above and beyond the call of the dollar. The student must have some of the same motivations, and it is one of the teacher's responsibilities to arouse them.*

---

* See also the very interesting discussion of grades and motivation in Mowat G. Fraser (1937, pp. 98-103). Fraser claims that the present system of grade-induced motivation has proven itself to be inefficient. It keeps the aim of the student divided between getting a grade and learning, and evidence of the inefficiency "is on every hand today in the fleeting confused results of college study, as well as in the widespread tendency of college students to refer to their scholastic progress not by the increasing ability gained but by their marks and credits, and to cease studying a subject as soon as the latter have been fully recorded." He feels that students may seek their supposed grade level and the grade system may work to unmotivate them.

There is reason to believe that grade motivation not only produces little in the way of learning, it may be encouraging a kind of learning which has peculiar irrelevance in our time. Carl Rogers (in press) and other educators have noted that the kind of education appropriate, until recently, might have prominently featured the inculcation of stored knowledge already accumulated; what is needed now, he argues, is the inculcation of the ability to meet problems in a rapidly changing manner. Students must learn the process by which new knowledge is to be acquired—learning how to learn. The older method is appropriate to an aboriginal society where extreme and constant threats have been met by standard methods painfully acquired by the race. In a constantly dynamic society, knowledge does not count for much, since every "subject" must be relearned in an ad hoc way all the time. Rogers argues (1) that knowledge is relatively useless because it dates fast; (2) students have an impressive rate of forgetting for knowledge acquired in relatively meaningless or hostile situations; and (3) therefore, the only way to inculcate the ability to learn the process of learning is to put students to work really learning. This is not necessarily uncontrolled learning, but it is much less highly regimented or externally imposed than what prevails at present. Rogers takes violent exception to the present method of encouraging education by offering extrinsic goals:

> the student's desire to learn can be trusted...human beings have a natural potentiality for learning....Self-initiated learning, involving the whole person of the learner—feelings as well as intellect—is the most pervasive and lasting....Creativity in learning is best facilitated when self-criticism and self-evaluation are basic, and evaluation by others is of secondary importance....The best research organizations, in industry as well as in the academic world, have learned that external evaluation is largely fruitless if the goal is creative work. The individual must be permitted to make his own evaluation of his own efforts.

E. GRADING AND GRADUATE ADMISSIONS

Proponents of the present grading system often believe they have given the coup de grace to any suggestions for changing it when they point to the important use made of grades in graduate school admissions and in transfers. But there is significant evidence to show that the whole matter of graduate admissions is badly handled, and that the air of reliability that the grading system gives it protects serious defects. One can point to the attrition rates between graduate school admissions and Ph.D.'s granted. Though there is no final set of figures one can look to, U. S. Government estimates of the rate go as high as 20 to 1 (Wright, 1965). Clearly, if these figures are at all reliable, then whatever system graduate admissions officers are using is not highly effective. Critics of the use of grades in graduate school admissions also argue that no legitimate extrapolation of the positive though mediocre results grades yield in predicting college grades from high school grades can be made at the graduate level. The relationships between predictors and graduate grades are generally lower in graduate schools. Most applicants have done reasonably well as undergraduates and hence may be comparatively homogeneous in academic ability as measured by grades. Graduate school grades are commonly restricted in range: A's and B's and a very occasional C. While one may study relationships between

high school grades A to F, and college grades A to F, Robert Heath of the Educational Testing Service told me it is impossible to do the same at the graduate level. Graduate schools take those with over a B average and then continue to give them B's or A's almost automatically. It becomes impossible then to determine whether college grades do predict graduate grades, and if they do, how much. In other words, though many graduate officers say that college grades predict success in graduate school and so should serve as an admission criterion, there is virtually no evidence for the assumption. It is just possible, particularly in the light of staggering attrition rates and the different kind of education that graduate schools are supposed to give, that we may be admitting the wrong people:

> Success at more advanced levels may be dependent upon a totally different pattern of abilities and proficiencies from that operative at a lower level. A recent study of factors related to success in a graduate school of psychology, for example, established that the undergraduate grade point average in science courses was more significant than undergraduate psychology grades (Juola, 1961, p. 313).

T. R. McConnell, Chairman of the Center for the Study of Higher Education at Berkeley, testifies that grades do not really work in measuring and predicting the kind of ability and performance that graduate schools are really interested in. And Edward Bowes, State-wide Director of Admissions, University of California, said that there is little evidence that anything used in determining graduate school admissions is very successful.

The problem of graduate admissions then, may be badly resolved by grades. It may be better to give graduate admissions officers more resources to conduct extensive admissions investigations than to skimp on their budgets and encourage them to use college grades to fill real gaps in knowledge. By considering individually each student who presents himself for admission The University of Michigan is able to show dramatic reductions in the number of drop-outs among those who enter at the college level. The extra money spent doing this is probably an economy in the long run; the teacher, the student, the administration and society save a lot of time, effort, and money when the right people are selected in the first place.

While graduate schools tend to demand letter grades from colleges, they can really make do with some other system. Howard M. Teaf, who organized a nationwide conference on grading two years ago, writes:

> I am rather surprised that your inquiry has developed evidence of "pressures exerted by graduate schools for conventional methods of evaluation." At our conference, there was naturally much discussion of this point both among the colleges and with the representatives of graduate schools and of associations of professional graduate schools. We found that all the graduate schools are in favor of continuing use of grades and averages as reported by the undergraduate colleges as a basis for their administrative procedure and decision. But all of them said that they could "learn to live without grades." On the other hand the undergraduate college people were apprehensive about undertaking radical alteration of their rating systems individually. I think I am correctly reflecting their apprehension when I say that they did not fear intentional discrimination against a college that abandoned a formal grading system, but they did fear unintentional discrimination in favor of the student from the college where there was the more definitely known grade, given two students with otherwise similar records and from colleges roughly comparable in standing.*

---

* Letter dated August 23, 1965.

F. GRADES AND TRANSFERS

Grades are also used in transfers, and more and more college students are transferring. But Dr. Dorothy M. Knoell, who has been studying the transfer problem within the California system of higher education for some years, writes that even "a pass/fail system of grading need not handicap the applicant for transfer from the University, if discussions with the receiving institutions are planned at an early stage" in the process of switching from a conventional grading system.* Dr. Knoell does not think that students transferring to prestige private institutions will have much difficulty. She strongly recommends that no reform in grading for pedagogical reasons be held up because of the anticipation of administrative difficulties. There may be difficulties, but they can be overcome with relative ease. Apparently, colleges can learn to live without grades just as graduate schools can.

G. GRADES AND EMPLOYMENT

Grades are also used by businesses in hiring, but opponents of the grading system point out that their use by business is by no means universal; businesses can do without as many grades as we give them, and it is the complaint of many businesses that what they really want from faculty is not grades, but personal and individual evaluation of students. The last point suggests that every effort should be made to establish some system whereby businesses can get recommendations from faculty on individual students.

There is little real evidence of the correlation between grades and success in business. Although the telephone company report (Kappel, 1962, pp. 8, 18) established that a significant, though slight, correlation exists between the final salary a man will reach and his college grades, few businesses put similar faith in the grading system. Placement officers point out that grades may reflect family crises, outside employment taking up study time, and many other nonacademic considerations.

H. GRADES AND THE BATTLE OF LIFE

One of the complaints most often heard against the grading system is that it encourages a kind of competition alien to the real purposes of university education. There is no need to document this complaint and there is no reliable information about just how much competitiveness there is and what its effects are. It is generally agreed however that there is a lot of it, and that it is not wholly a good thing. Some people feel that much of the student unrest at Berkeley and elsewhere stems from the competitive atmosphere. Mervin Freedman (1964) attributes part of the phenomenon of student alienation in colleges both large and small to the competitive situation the student is thrust into.

---

* Letter dated August 23, 1965

> Consider the situation of an entering freshman at a prominent college. He enters a complex social environment in which he knows few people. He feels very much on trial. He is unsure of himself and his abilities. Faculty members and administrators are likely to be perceived as distant impartial judges if not as inquisitors. He may have been his class valedictorian in secondary school, but the quality of competition being what it is at most important colleges these days, he is likely to be a B student in his first quarter or semester. For someone accustomed to straight A's, a B average is something of a blow. Since he is in competition for grades with his fellow students, it is difficult to establish with them relationships in which he can relax and simply be himself. Of course, most students do recognize after a while that they can perform at least adequately within the system. They do form friendships which provide mutual support and comfort. But even when this does occur, as I have indicated, it is all too often a matter of anonymous socialization at the expense of intrinsic individual development.

As noted earlier, demands for grades will differ from business to business, making it difficult to generalize about how business uses grades. Some businesses which are unable to get up sophisticated screening procedures tend to rely on them. Larger businesses do not need them so much. In certain areas, grades are scarcely used at all. A letter from Professor Zivnuska of the University of California, Berkeley, School of Forestry, notes that "in regard to the professional employment of our graduates, grades are far less important than in the academic world... [employers] rely heavily on the recommendations of the faculty." Professor H. L. Vaughan of the Berkeley College of Environmental Design writes:

> In the hiring of graduates of Departments of Architecture and Landscape Architecture, I think employers depend almost entirely upon exhibits of work rather than upon grades in courses. Our fields may be unique in that our students produce so much tangible evidence of ability or lack of it in the form of drawings and reports.

Professor Morgan, Dean of the Berkeley School of Optometry, writes that employers seldom use grades in their hiring decisions, unless the employer is another teaching or research institution. They rely on personal recommendations about such things as character, appearance, and the like. It is fair to say that employers seeking candidates to fill jobs closely related to academic work, like research, do use grades but not all of these do use or need them; other kinds of employers may or may not use them, but could probably do well without them and might even do better. Ralph Tyler, Director of the Center for Advanced Study in the Behavioral Sciences at Stanford, says that grades are often used by businesses only in lieu of other information. Several student consultants complained that under the present system the goal of Berkeley students too often becomes 'winning' and not doing a better job.

Those who defend grades counter these arguments by saying that the competitive situation that grades induce is a preparation for life. Anti-graders reply that life is competitive, but the kind of competition prevailing in life does not resemble the one prevailing in the school. They claim it is difficult to find an institution other than the educational one in which people are publicly graded as many as thirty or forty times each four months, their grades tabulated and averaged, and their persons ranked according to decimal points. The armed forces, business, and government all work in quite different ways. Nor is there reason to believe that

if grades disappeared students would lose the benefits of a healthy competitive situation. There would still be standards and evaluation, both academic and nonacademic, in the student community as there are now in the community at large.

> The notion that grading prepares people for life seems doubtful to many on other grounds as well.
>
> Some legitimate aims of instruction may not be easy to incorporate into the evaluation devices which make up the grading system: indeed, there is little if any evidence that grades in college are or are not related to postcollege criteria of success, beyond predicting graduate school achievement (Davis, 1964a).*

Even if grades are eventually able to predict success in different work roles, Davis has noted, grades may never be an index of a student's potential for self-satisfaction in nonprofessional roles. At least there is no evidence to indicate that grading helps people lead the good life. Quite the contrary, it may be argued that the grading system discourages the development in the student of intrinsic and lasting intellectual interests, and of self-definition generally.

Student consultants pointed again to the peculiarity of the grading system. In "real life" there is nothing like the frequency of grading, the pretension to objectivity, the relative rankings within large groups, and above all the reliance on a single letter or combinations of similar letters rather than personal recommendations. All recommendations for promotion in real life, they noted, generally go by way of personal written or oral recommendation. Nothing as simple as a grade is permitted. The very uniqueness of the grade system in these odd respects might suggest that it is a hindrance in preparing for life rather than a help. One might consider the case of noncreative people who are high grade achievers; they come to the dissertation stage of the Ph.D. and they are unable to formulate a problem because their highly regimented education, dependent on outside stimuli, has not prepared them for a situation in which there is no assignment. Such a complaint was voiced by one professor of economics about too many of his graduate students who no longer have a due date or an immediate punishment facing them. This crippled perspective on achievement can hinder a student later; he is often incapable immediately after college of motivating himself, or arranging his own time, and so forth. Grades are also false to other realities of life. They encourage the student to believe that life is divided into neat portions by terminal situations. The feeling, which many of our students acquire, that "when the test is over the responsibility is over" is probably not a good preparation for life. Mason Haire, a noted industrial psychologist at Berkeley, complains that grading also leads to a sense of discontinuity that does not

---

* William S. Learned (1940-41) says, "The outstanding impression which the...data leave with the objective inquirer is certainly not one of close correspondence between academic record and later achievement as expressed in salaries or advancement in position."

exist in life; too much academic work is done in pieces under present systems——so much credit for this little bit of work. Some critics of the grading system see it so little related to life as to be grotesque:

> How would you like being, let's say, a physician if your bag and your car were marked RATHER MEDIOCRE DOCTOR? Or a lawyer if your briefcase were stamped BARELY 60–SLOPPY–A SHYSTER? Or then again, considering also those on the other side of the fence, how would you like being a pharmacist if you had to post over your shop a sign reading in loud, red letters: TERRIFIC CHAP - A GENIUS? Or a housewife who had to walk about the house in an apron inscribed: WONDERFUL COOK - MAGNIFICENT BREEDER?
>
> Under conditions similar to these, unbelievable as it seems, do our youngsters have to spend the first twenty-odd years of their lives. They are marked by their teachers, and consequently by their parents and the parents of their colleagues as to what they really are, at least in the eyes of the masters of pedagogy. Their accomplishments are counted out — usually in uneven numbers — and these numbers are impressed indelibly not only on various papers and documents, but also upon the hearts of those youngsters and upon the cold faces of the so-called "protective adult body" of parents and neighbors, under whose pressure the children carry on (Runes, 1961, pp. 14-15).

It has also been argued that the continual presence of outside judges may cripple the student's capacity for self-evaluation, thereby encouraging conformity and general mindlessness later. The constant rhythm of reward in school may also contribute to an American's constantly collecting new status symbols. If "real life," as one of our graduate student consultants argued, assured people of regular advancement in career and out, perhaps these alphabetical signs of prestige would be necessary, but life does not do so; yet the American people are conditioned by the schools and specifically by grading and promotion to expect some sort of symbolic award or recognition regularly.

> As long ago as 1939, the Ohio State Lantern reported:
>
> The grading system stamps college as a make-believe world. At least that inference can be drawn from a statement made last week by Dr. Felix Held, secretary of the College of Commerce. Speaking on "The College Man in Business," Dr. Held said: "The firm doesn't grade you on the basis of A, B, or C, but on the satisfactory manner in which your job is done. You either succeed or fail."
>
> In the outside world we either pass or flunk, Dr. Held tells us....It's so confusing that many of us get the impression that those little letters really mean something; so we spend all our time working for a grade instead of concentrating on the real business of getting an education ....We sometimes wonder, since we are here preparing for the outside world, if it wouldn't be a good idea to junk the grading system and abide by the same rules here that the outside world uses.

It is interesting to notice that at the University of California nonacademic employees are ranked on specific job assignments only on a three-point, not a five-point scale: "Improvement needed," "Satisfactory," and "More than Satisfactory." There is no pretense at being able to measure achievement in a very precise way. This is the equivalent of a pass-fail-honors system. Moreover, the "Confidential Employee Development

Worksheet" has ample space next to the ranking for each assignment for "Comments and Future Objectives" and for a substantial comment on "Over-All Evaluation." The over-all evaluation is also on a three-point scale, but it must be justified in a personal prose report: "(State reasons for)." It is also unlike the system for giving a single letter grade in that it demands recommendations for the employee's future progress, something needed perhaps even more in education: "Future Plans: Suggestions Made to Employee for Improving Performance." That is to say, if the University of California business management is at all typical, the evaluative system in business is radically different from the college grade system. It is personal, developmental, complex, relative to the task rather than to other employees, yielding no elaborate ranking but a definition of a person's individual success.

Mason Haire reports that industry runs many types of schools at various levels and on various subjects but he "doesn't know of any industrial school that uses grades. They all use more detailed evaluation forms for students on the basis of personal acquaintance." It is also interesting that in letters of inquiry sent to Berkeley graduate departments asking if they could admit students without the present number of grades on their records, those departments, like Forestry and Optometry, which are most closely associated with business and the outside world were generally the most nonchalant about saying that grades could be eliminated. The academic departments, on the other hand, particularly in the sciences, tended to say that grades were necessary because they prepared people for real life. According to Mason Haire, evaluation in industry is not usually as contaminated as under the grading process; subordinate and supervisor work toward a common objective, and the worker is not graded on initiative, attitude, and the like, but more on what he produces. He said that business really operates on a pass-fail system: one is either promoted or not; he is not put in a lock-step and graded. Some companies had grading systems in which a man was classified according to five categories in regard to his probability of proving a leader. The systems have been dropped because they did not produce results. Many companies used to have different starting salaries for people with different grade-point averages hired for similar work, but this system has also been abandoned. It is difficult, in the light of all this evidence, to conclude that grades effectively prepare people for real life, whether by fostering "realistic" competition or in some other way.*

I. GRADES AND HONORS

Though grades are now instrumental in the distribution of college honors, it is likely that a simplified grading system would serve as well. A letter to the Committee from Albert E. Medler, Dean at Rutgers, reporting on efforts to simplify the grading system there reads in part: "Detailed studies showed that such a

---

* A recent study by Donald P. Hoyt (1965, p. i) has for the moment put the burden of proof on those who claim that grades are a preparation for life: "Although this area of research is plagued by many theoretical, experimental, measurement, and statistical difficulties, present evidence strongly suggests that college grades bear little or no relationship to any measures of adult accomplishment."

system (P-F-H) would be quite as effective in determining academic honors, including Phi Beta Kappa membership, as the present system of cumulative gpa." Opponents of the grading system go on to argue that the present system for distributing honors, while it makes a great pretense at objectivity and fairness, actually tends to reward the dull plodder and to ignore the bright, creative student who may be too busy learning to achieve high grades. It is a common experience of everyone who has ever scanned a Phi Beta Kappa list that some of the "best people" are not on it and some of the most mediocre are. It is interesting to note that while scientist-teachers are the strongest believers in grades and their validity, the Society of Sigma Xi, the scientific honor society, has recently decided to award its membership only on the basis of research, and not on the basis of grades. Curiously, Phi Beta Kappa has recently reaffirmed and strengthened its reliance on grades — a disappointing occurrence to many interested in rewarding our "best students."

J. GRADES AND CREATIVITY

Closely related to the complaint about the use of grades in the award of honors is the objection that grades have a negative or low correlation with the trait of "creativity." There is a small amount of evidence to support the contention that grades are positively related to creativity: a study of engineering graduates from Purdue done by William K. Lebold showed a significant relation between the graduates who registered patents and college grades. However, all the other information we have gathered tends to point in the other direction. The study by Kelley (1958) on discrepancies between instructor grades and term-end grades in the same course showed that those students who got higher ratings from the instructor indicated on personality tests that they were more conforming, compulsive, rigid, and insecure than the other group studied. This would show that teachers tend to bias their grades in favor of conformists. Another study, by Holland (1960), showed that the nonintellectual factors most related to academic achievement are persistence, strong superego, and the like. Holland then cited Cattell's findings on the characteristics of the creative person: intelligence, emotional maturity, dominance, adventurousness, sensitivity, introversion, radicalism, self-sufficiency, tenseness, less subjection to group standards, impulsiveness, and the like. The two sets of personality traits for achievers and for creative types are at odds: though two of the scales correlate, five are neutral, and five have a negative correlation with one another. The implication is that the college achiever has less potential for creativity than many nonachievers. Holland suggests that something should be done about the uncritical use of college and high school grades as predictors of postcollege achievement and as criteria for the award of fellowships and scholarships.

Dr. Mervin Freedman, in an interview, partly explained these discrepancies: observations indicate that the more creative and individual students tend to be more troublesome to the average teacher than other students. If the teacher's concern is with order and covering the material, and such a concern may seem

inevitable in large universities, then someone who gets off the beaten track may get in the way of instruction and be penalized for it by grading, whether the instructor is conscious of such discrimination or not. In other words, the downgrading of creative students, or their failure to achieve good grades, may be a necessary consequence of the various systems involved and may therefore not be susceptible of even the most diligent faculty efforts to control the situation. One solution to this penalizing of the creative student is to give as few grades as possible.

Evidence for the negative or low correlation between grades and creativity appears in virtually every field. According to Mason Haire, the business school at Berkeley found about a 0.15 (or to all intents and purposes a 0) correlation between college grades and the creativity of its graduate students. In a study (Holland, 1961) in earlier grades, of creative achievement in both science and the arts, similar results were obtained. Here creativity was defined more or less as the winning of some public recognition for original work. Then the creative and noncreative students were given psychological tests, and various correlations were made. "Academic performance appears to be the function of...perseverance, self control, good behavior (good citizenship)...and rigidity....Creative performance seems to be the outcome of a conscious conception of being original, active participation in creative hobbies, an asocial temperament, independence, reinforcement by parents of similar values." Once again, academic achievement and creativity seem to be consequences of entirely different qualities and dispositions. There seems to be a negligible relationship between the two types of achievement. The negligible relationship found between academic aptitude and creative performance at a high aptitude level suggests that we need to use nonintellectual criteria in the selection of students for scholarships and fellowships."

One of the most curious things about studies of grades and creativity, is that all of those that have been done correlating faculty ratings of creativity with grades show that the faculty is aware of the discrepancy. A study done by Junius A. Davis (1964b) at Amherst, the California Institute of Technology, Cornell, Dartmouth, MIT, Rensselaer Polytechnic Institute, Rutgers, and Stanford showed that faculty evaluations of students on a scale of creativity had a low correlation with the grades that the same faculty members gave to the students. It is important to remember that in this case it was not psychologists who were defining creativity, but the faculty themselves. A study done at The University of Michigan on graduate students, particularly in the area of graduate psychology courses, showed that undergraduate gpa had a 0.10 correlation with faculty prediction of professional contributions from the students, a 0.08 correlation with faculty predictions of contributions to science, but it had a 0.42 correlation with grades in graduate school (Platz, McClintock, and Katz, 1959).

It seems reasonably clear that the grading system, at all levels including the graduate one, tends to reward the conforming plodder and to penalize the imaginative student who is likely to make a significant contribution in nearly any field. It is obvious that the discouragement and neglect that creative students tend

to receive are only expressed in grades. The causes of the problem of the creative student lie deeper within our educational structure. But the expression of dissatisfaction and even displeasure that grades allow teachers to make is almost certainly a major factor in causing the flight of the potentially creative student from the great variety of colleges Paul Heist has studied. It seems obvious that an evaluative system that allowed teachers to comment on creativity and to reward it publicly, or an evaluative system that was at least so simplified that creativity could not be penalized, might be a step toward halting the purge of creative students from our universities.

Some would argue, however, that creative and nonconforming students do not belong in college. That would be a shocking tack to pursue, but one often hears it. On the other hand, it becomes increasingly obvious to all that one must go to college if one is to be successful in all but a very few fields. In fact the creative students do come to college and then tend to leave it. Some argue that alienation has always been good for creativity—perhaps so. But it seems self-evident that the inhospitable environment which colleges present to the creative person, and the punishment that grades visit upon him, probably do our society more harm than good. In fact, an estimate of the social cost that the wear and tear of low grades and lack of recognition visit on our society would probably be staggering. Fortunately, it is impossible to calculate; only the light of imagination may find it.

K. SUMMARY OF ARGUMENTS AGAINST THE CURRENT GRADING SYSTEM

(1) Conventional A-F letter grading corrupts the teaching situation by encouraging "grade grubbing" and alienating student from teacher.

(2) It is neither accurate, being dependent on too many nonacademic variables, nor is it uniform. A grade from one instructor or one college does not mean the same thing as a grade from another.

(3) It encourages a mechanical kind of learning and restricts the creative leisure of the student. It encourages conformity in some students, cynicism in some, and rebellion in others. It is certainly out of tune with the aspirations of the new student generation.

(4) It does not, as is claimed, significantly stabilize the academic standards of the university.

(5) There is little evidence that it motivates students, less that it motivates them to learn significantly. What evidence there is suggests that learning proceeds more efficiently when students are encouraged to motivate themselves.

(6) It serves the purpose of determining graduate admissions, but badly. There is little evidence that we are choosing the right people for graduate school when we use grades without great amounts of supplementary information. There is evidence that the graduate schools could do without conventional letter grades.

(7) There is evidence that transfers could be handled without conventional grades.

(8) There is evidence that businesses can manage to hire without conventional grades.

(9) There is a great deal of evidence to show that the grading system has no counterpart in real life, that grades are not related to success except in academically allied fields, and that it is in many ways a negative preparation for life.

(10) There is considerable evidence that the grading system discourages and finally weeds out the most creative students, that it discourages creativity in general.

(11) Grading protects and even encourages bad teaching.

III

SOME PROPOSALS

The list of criticisms of the present system of evaluation is formidable and cannot be ignored by those interested in improving education in the university. It is clear that any change in the system that would not lead to serious disadvantages and that would eliminate some of the sources of criticism is highly desirable. Frequent suggestions for reform include increasing the number of distinctions, adding plus and minus signs, going on a percentage system, and the like. Experience testifies that grading on the basis of more than five distinctions leads to only the show of exactitude. While many schools had percentage systems at the beginning of the century, only a small fraction of American colleges have them now. The President of Lake Forest College, himself very interested in matters of grading reform, has written that "there is considerable evidence that on a three-point grading system, that is, Fail, Pass, and Honors, you can give any number of student exercises to any number of faculty to evaluate and you will get virtual unanimity of judgment. For every additional grade that you bring into the picture thereafter, divergences in faculty evaluation and judgment appear in geometric ratio."* If we take into account the testimony of history offered by the radical expansion of pass-fail grading in recent years, we are justified in saying that the academic community has rejected more elaborate systems of grading than the five-point system, and is in the process of moving to even simpler and more valid procedures. Furthermore, an increase in the number of grading distinctions would answer virtually none of the objections critics of the present system have, including the objection of inaccuracy.

There are some promising reforms that the individual teacher can easily practice by himself. Dr. Ann M. Heiss of the Center for the Study of Higher Education at Berkeley told us in an interview that one fundamental improvement would be to have instructors minimize their references to grades and testing. Her researches on education at Berkeley have shown that faculty are to a large extent responsible for the emphasis on grading that prevails there. Another reform that the individual teacher can practice, and that was uniformly suggested by our student consultants, is less grading and more diagnostic commentary on their work. They want criticisms on bluebooks, papers, and other exercises. They want suggestions for improvement, and they are entitled to them.

---

* Letter to Select Committee dated June 29, 1965.

There is reason to believe that more general, institutional changes would also be successful. Grading systems are being liberalized all over the country. Any move for liberalization, and even one for elimination of grading, would find many precedents in the present climate of dissatisfaction with letter grades.

Now, no one can offer a formula that will solve the grading problem for the enormous variety of institutions in American higher education. I can, however, suggest here some of the alternatives that might be pursued, together with some of their respective virtues and faults. None of these will, in the form I present them, be anything more than a direction for faculty discussion to follow; each school will have to find a particular evaluation system that is compatible with its particular educational objectives. Then, it will be necessary that the school make its system comprehensible to the outside world (the most powerful objection to changing from the present standard grading system is that it is a standard system). To this latter end I have recorded the tentative steps being taken to promote cooperative research and development on grading systems.

A. PASS-FAIL GRADING

There are some valid objections, from a reformer's point of view, to taking pass-fail grading as an overall solution to the grading problem. Some object that (1) pass-fail grading is still teacher-set grading; grades have not been removed from the classroom, though we can expect their negative effects on the teaching situation will be diminished; and (2) the pass and fail grades will still suffer from inaccuracy and from variation with the instructor. But even here, the number of students who will be graded in a variable way will be radically diminished, and the influence of special nonacademic biases will largely disappear when there are only two grades. One can also expect improvement in the areas criticized in our above summary of arguments against the grading system: nos. 3, 5, 9, 10, and 11. A few comments are in order on these anticipated improvements.

We may expect, for example, under a system in which the student has only to pass a course, that it will no longer be possible for the bad teacher to keep a captive audience under his control. There will be something resembling a free market for the better students, and we may expect that only those classes where real teaching is going on will be frequently attended. This will naturally cause resentment among some faculty members; and it will be difficult to get votes in a faculty senate from many teachers who are consciously or unconsciously insecure about their probable fortunes under such a system.

Within this sort of system, one might argue, the student will have to learn to motivate himself; he will have to decide why he is in college; he will not be able to hide mindlessness under the mantle of a C or B grade-point average. In the intellectual atmosphere of a college, he will be forced to prove his intellectual worth to his peers in some meaningful way. Such a system would encourage the student to prepare for life

more realistically. Cheating will diminish. In the area of motivation, there is much contrary speculation about what will happen. It is reasonable to expect that students will undergo a period of adjustment to the new system in its first years. Initially there may be considerable confusion and perhaps some loafing. But it is unlikely that loafing will be more than a temporary reaction; our better students are probably wise enough about their future lives and careers to learn how to value education for itself, once the euphoria has worn off. Our poorer students will no more be able to loaf under pass-fail than they can at present. It is really almost impossible to predict all the benefits because such a reform has never been tried on a university-wide scale. Therefore, if a faculty adopts any reform, it should be careful to make sure the reform will be given a chance to succeed.

There will be difficulty in keeping such a simplified system if it is ever established. Paul Dressel and Clarence Nelson (1961, p. 229) write:

> ... the occasional proposal to replace the A-to-F range by a pass-fail dichotomy has generally existed but briefly. The insistence that a student of distinction be recognized adds a third category to the scale, and the interpolation of additional categories between the middle and the extreme ratings of the trichotomy once again restores five grades.

Again, any tendency to prejudice the results of an experiment in this direction must be curtailed from the start by a commitment to trying the experiment, unchanged, over a number of years. Furthermore, the argument that distinction must be recognized in the form of grades is not entirely persuasive. The instructor will have ample opportunity to recognize distinction in his talks with the students and comments on their work.

Distinction may be recorded for posterity in an expanded system of individual student evaluations as well. Instead of "honor" grades being allowed to impinge on a pass-fail system, one might recommend a radical expansion in the number of other kinds of honors provided by the university. Taking part in an honors curriculum is an honor; this kind of achievement, both academic and nonacademic, intellectual and nonintellectual, might radically increase, under a pass-fail system. Evidence coming from the California Institute of Technology's experiment with pass-fail grading for freshmen indicates that while freshmen tended to work somewhat less in their courses (this, by the way, is not yet interpreted to mean that they achieved less), they embraced the honors option open to them in numbers double or triple those under the old grading system. The honors program at Cal Tech consists of participation in a research project under the guidance of a professor; it is open to all students. Under the old grading system students would register for it the first quarter, but many would drop it by the third quarter in order to keep up their grade-point averages. In the first year of the Cal Tech experiment, they registered in larger numbers than ever before and did finish all three quarters. Certainly, under any pass-fail system, the opportunity for students to achieve independently but within an academic context should be increased radically. Whether honors grades are officially attached to the achievement is irrelevant. The creative energies released by an end to coercion would to some degree be channeled in constructive and academic directions.

Another difficulty with a pass-fail option, critics suggest, is that it would be impossible to award scholarships. But the number of students applying for scholarships is not large. The student must apply for them himself, and the burden of proof could be placed on him. He might be required to compile a dossier of recommendations and other evidence of distinction, such as papers and other creative projects. It may take the infusion of some more money into the scholarship committee's budget to handle this problem, but it scarcely seems insuperable. While pass-fail grading may make awarding scholarships seemingly less objective, in fact it will become no less objective, merely more flexible and perhaps more rational. The Woodrow Wilson Fellowship Foundation indicates it could screen candidates on the basis of whatever evaluative system we have. If they can do it, so can others.

In considering the use of the pass-fail system, a faculty has the choice of a number of alternative applications.

1. Minor Enlargement of the Pass-fail Option. One could choose to imitate schools like Princeton, Pomona, and others that are about to or have instituted the pass-fail option for a certain percentage of courses. The Princeton plan puts a certain number of courses, usually of small enrollment, on a pass-fail basis each semester. These courses would be taken outside the major; they would allow for exploration in nonmajor fields. Though such a very cautious answer to the grading problem offers an opportunity not now available, it does not relieve the student of the burden of competition, anxiety, and the rest, nor does it change the teaching situation in general. It does not go very far in response to the faults of the grading system.

2. Pass-fail in the Breadth Requirements. This improvement would eliminate grading in as much as a quarter of the student's work, thus carrying many of the benefits of a program for pass-fail in the first two years to be described. Furthermore, it would lead to valuable experimentation in accordance with the purposes of the breadth requirements. Under the present graded system, for a breadth requirement say, a student might know he could pass chemistry and want to take it, but he might also know that he could get an A in geology. It is reasonable to expect that under a uniform pass-fail system for breadth requirements he would feel freer to seek those courses which might really interest him and be in his judgment most valuable. The grade consideration would disappear from his sampling of courses outside his major field.

Another advantage of such a plan is that it might allow the professor some extra freedom. Without the need to grade students competitively, the professor would have less need to hold them to rigidly uniform assignments; he would be free to accept diverse modes of achievement and thus might find more variety and interest for himself in his teaching of the course.

Pass-fail in breadth requirements would allow the student to experiment outside his specialty all four years. It would also lend itself to interesting new educational directions. Great flexibility in arranging student schedules, and an atmosphere hospitable to a variety of field studies, would be created by the grading of general requirements in a simple, unified way.

3. Pass-fail in All Nonmajor Courses. The advantages and disadvantages of this system may be calculated in large part by extrapolating them from the descriptions of previous systems. One notable objection: it would put a lot of pressure on the student for achievement in the major as measured by grades. This might be desirable if the faculty wishes to stress extrinsically disciplined performance in the major. Under any pass-fail system outside the major, the major would be affected in fairly predictable ways. For example, students might "work harder," but they might lose independence and self-motivation (both important factors in significant learning) in the major field which is graded on a coercive system as opposed to the grading system for other courses.

4. Pass-fail in the First Two Years. This is the pass-fail proposal that at once seems most likely of being acceptable to faculty, to graduate schools, business, and others, and that would at the same time go farthest toward alleviating many of the difficulties of the present system. Mrs. Nansi Corson, at the Placement Office at Berkeley, has said that there should be no difficulty in dealing with business under a pass-fail system for the first two years. My survey of graduate departments both within and without the University of California indicates that while certain graduate admissions officers, particularly at the departmental level, are reluctant to endorse pass-fail in the first two years, they admit when pressed that it will make virtually no difference in their consideration of applicants. Grades in the major and in the last two years are the decisive factor in graduate admissions; though some graduate admissions officers say they sometimes consider the improvement in a student's record over all four years, they agree that this is not an important factor. Admittedly, this method does not go all the way toward answering the objections to the present system; it does not reform grading in the second two years, for example. Another objection is that it puts excessive pressure on the junior and senior years, and creates a discontinuity in our evaluative rhythm. One might reply that some reform is better than none, and in any event this one would reduce some of the damage done to freshmen and sophomores.

5. Pass-fail in All Four Years. This seems eminently sensible; it allows exploration and individual achievement, relieves students of irrelevant pressure, puts the burden of educating himself on the student, does away with tensions and distortions in the teaching situation, and so forth. Academic standards could be maintained and transfers and scholarships handled in the ways suggested in the previous pass-fail plan. On the other hand, graduate schools would have extreme difficulty in dealing with the students. An extensive alternative system of evaluation might have to be invented (for example, qualifying examinations neither written

nor designed by the instructor; an expansion of the amount of recommendation writing, and so forth).

B. COMPREHENSIVE EXAMINATIONS

One important alternative a faculty should consider is the development of a system of qualifying examinations for majors and for breadth requirements. Such a system could operate with or without a pass-fail system for courses, and it could generate either conventional grades, or prose reports of student achievements, or both. This method of examining is highly controversial, and it is literally impossible to get secondhand information which is finally convincing. It was tried at the University of Chicago for many years. Some report that it was highly successful, but others who taught there or knew people who taught there report much complaint. It is possible that many of the complaints could be answered by perfecting the basic Chicago model.

At the University of Chicago, examinations were written by a testing office composed of (1) members of the faculty in various disciplines, (2) members of the faculty in a particular discipline being tested, and (3) psychologists, usually recruited from the faculty. With the help of pedagogical and psychometric expertise, examinations of a very high order of reliability and validity* were designed in a number of fields. Students received no grades in courses; all courses were optional; a student had to pass a given number of exams in order to graduate and be certified as having completed the requirements of the University.

There were many advantages to the system: most notably, rather than making student and teacher antagonists in a game to see what grade the student might win, it made them comrades and colleagues in criticizing the examinations and in preparing for them. Education was the goal. If the student complains about an examination under our present system, he may feel he will be punished; under the Chicago system, his complaint seems to him, and is in fact, a step in refining the educational process.

Another advantage of this system is that it forces the professor to really define, in advance, what the student is expected to learn. Chicago made its instructors define the passing, failing, and honors levels of performance before the tests were administered. The student then was graded on his mastery of the skills and subject matter that education is supposed to impart, not on the basis of a series of relative numbers. As long as there is a set of relative numbers to measure himself against, the student is tempted to beat the system and get ahead of someone else.

---

* Reliability and validity are two concepts psychologists have developed in the area of testing. A test is reliable when it works the same on two different occasions; a test is valid when you are measuring what you think you are measuring.

The tests were exhaustive, sometimes taking a week. Time was not a factor—what Chicago wanted was a sophisticated judgment of the student's performance based on ample opportunity for him to perform. The student then was given an analysis of his performance, with recommendations for remedial work, as well as a grade. The testing office of the University prepared these analyses and sent them to the student. Only a grade was entered on the student's record card, but the analyses were available for those who had a definite use for them. That is to say, the system might generate commentary on a student's prose style, his analytic reasoning, his mastery of subject matter, and other aspects of his achievement in a given area. These would supplement the letter grade.

The system allowed the University to define broad but definite goals for education. It also encouraged the various departments to define their goals in more detail. It was required that there should be certain notions common to writing all the examinations, e.g., (1) the student understands the basic problems and approaches of the discipline, and (2) the student has the basic information. In preparing for the examinations, the student was given various resources: courses he might take, syllabuses, reading lists, and the option to take practice examinations which were analyzed but not graded. The student could then check on his rate of progress. Examinations were highly complex and flexible, and could include four or five hundred "objective" questions, open book essays, library assignments in research, laboratory assignments, and so forth. At the end of his college career a student would have one grade in the major, another in the minor, and six in general education (humanities, English composition, social science, biological science, physical science, mathematics), and then a number of pass-fail grades in the remaining electives.*

There are many objections to the Chicago system and to comprehensive examinations in general.** It is objected that diverse course offerings are impossible under a comprehensive examination system. But clearly diverse course offerings are possible if they have a common purpose. There can easily be a confusion between diversity of approach and diversity of educational objectives. One generally expects a person to acquire some skills and knowledge common to a discipline, but the methods of acquiring those skills and knowledge may be as diverse as the numbers of teachers and students. The examiners at Chicago tried to get at what the objectives of the faculty were; the method of achieving the objectives was not their concern.

---

* My information about Chicago comes from conversations with several people, including Ralph Tyler who headed the examination office there for some years, an article by B. S. Bloom (1954), and recent correspondence with the University.

** I prefer the more flexible term "qualifying examination"; "comprehensive examination" sounds more formidable. In fact any examination that comprehends whatever substantial amount of material is comprehensive: a midterm, a final, a master's oral. The exams I have in mind would qualify students for various degree requirements and hence be "qualifying" examinations.

However, the effort to discover common goals can be overdone; the members of a Department of English, for example, approach their subject in a variety of ways and with different results. Therefore, it would probably be better to design comprehensive examinations for an English major that would demand that every student demonstrate common knowledge and skill in only part of the examination. The other part of the examination would offer several options for the demonstration of excellence in various areas; there would be questions that would allow the aspirant literary critic, textual scholar, poet, historical scholar, prosodist, and so forth, all to prove themselves on their own terms. This kind of flexibility is built into Oxford's general examinations, though the investment of some time and money might come up with much better examinations than Oxford gives. Analyses of such flexible examinations might report to graduate schools that Jones shows a good basic command of the fundamental texts and is excellent at criticizing them; he is very strong in prosodic analysis, weak in literary history, etc., etc. Such an analysis might be better than a mere letter grade, but the examination could also generate the conventional A to F grades that more clumsy and inaccurate methods do now. Graduate schools would have three or four different scores for a field, not five measuring the same thing.

The advantages of such a system are striking and can easily be imagined by checking the list of criticisms of the present system against it. It does not, however, do away with grading pressure on students; it replaces grading trauma with one great final exam trauma. To meet this objection one might offer the examinations in parts; the examination in the major, for instance, might be offered partly in the junior year and partly in the senior year, with provision for second-chance reexaminations. In nearly every other respect, it is an improvement over the present system. The real difficulty with it, of course, is that it will take time and money to develop.

A comprehensive examination system would be a particularly logical supplement to a pass-fail system in the courses for the major. The University of California campuses at Irvine and Santa Cruz are both developing comprehensive examination systems, and Irvine is working with the Educational Testing Service in this development. It has been suggested that the resources of the state-wide university systems give adequate manpower for setting up a system of outside examiners for a given campus. This does not mean that the examination in the physics major, say, would have to be uniform throughout the state, only that a given campus could draw on examiners from other campuses to help it run its examination system. Such a system would allow a particular school to check on the validity of its educational offerings.

C. RECOMMENDATIONS

Another alternative to the present grading system, one that might be combined with comprehensive exams, or pass-fail, would be a system of prose reports on a student. These would be generated in the small

classes he takes during his college career; they could be written either in response to a standardized format or not. Their main advantage would be providing detailed information about the variety of a student's achievements and characteristics. Their main disadvantage is that they leave evaluation in the teaching situation and therefore may prevent the student's being honest about pursuing his own educational objectives; in other words, they provide the opportunity for much more complete pandering to what the student views as the professor's values and prejudices.

D. THE DOSSIER

Partly to offset the disadvantages of a simple recommendation system, one could envision compiling a dossier on a student that would include recommendations and also more palpable evidence of a student's achievement. The student could send to a central office such items as his best papers, descriptions of independent study programs, of field study, of extra-curricular activity; other items might be recordings of speeches, reports of committees on which the student has served, fragments of novels, recital programs, photographs of works of art, and the like. The dossier could be evaluated by a committee of professors who, at regular intervals, would help the student determine if he were making adequate progress toward satisfying the general educational aims of an institution. When the committee thought the student had satisfied these aims, it could recommend that he be awarded the appropriate degree. When the student graduated his dossier could be sent, at his request, to graduate schools and businesses.

E. NATIONAL COOPERATION

The adoption by any school of any or all of these departures from the standard grading system almost necessarily implies the cooperation of the school in a national program to make the new systems comprehensible to other institutions. A national effort toward research and development in the area of student evaluation is underway. An Inter-University Committee on College Grading Systems is in the process of applying for funds to call a series of conferences. What is finally envisioned is a national center that would collect information on research and development, disseminate it, help fund experiments, and help explain the evaluation system of one school to other institutions. Interested parties should write to Professor Stuart Miller, Livingston College, Rutgers · The State University, New Brunswick, New Jersey, 08903.

REFERENCES

Aiken, L. R. The Grading Behavior of a College Faculty, Educational and Psychological Measurement, 1963, 23, 319-322.

Barron, F. Complexity-Simplicity as a Personality Dimension, Journal of Abnormal Psychology, 1953, 48, 163-172.

Birney, R. C. The Effects of Grades on Students in College Grading Systems: A Journal Symposium, Journal of Higher Education, 1964, 35, 96-98.

Bloom, B. S. Changing Conceptions of Examining at the University of Chicago. In P. L. Dressel (Ed.), Evaluation in General Education. Dubuque, Iowa: W. C. Brown, 1954.

Botanical Society of America. Committee on the Teaching of Botany in American Colleges and Universities. An Exploratory Study of the Teaching of Botany in the Colleges and Universities of the United States (Publication No. 119). Ithaca, N. Y.: Author, 1938.

Crawford, A. B. Rubber Micrometers, School and Society, 1930, 32, 223-240.

Davis, J. A. The Criterion Problem in College Admissions Research: Vistas and Blind Alleys. Paper presented at the Harvard Conference on Educational Research, sponsored by the CEEB, June 11-12, 1964. (a)

Davis, J. A. Summary of Major Findings from the College Student Characteristics Study. Princeton, N. J.: Educational Testing Service, 1964. (b)

Dressel, P. L. and Associates. Evaluation in Higher Education. Boston: Houghton Mifflin, 1961.

Dressel, P. L., and Nelson, C. H., Testing and Grading Policies. In P. L. Dressel and Associates, Evaluation in Higher Education. Boston: Houghton Mifflin, 1961.

Evans, L. D. Essentials of Liberal Education. Boston: Ginn, 1942.

Fraser, M. G. The College of the Future. New York: Columbia Univ. Press, 1937.

Freedman, M. The Mens Colleges and the Image of Man, Journal of the American Association of University Women, 1964, 57, 107-110.

Fricke, B. G. Evaluation of Student Achievement, Memo to the Faculty No. 11, April 1965. Ann Arbor: Center for Research on Learning and Teaching, The University of Michigan.

Haagen, C. H. The Origins of a Grade, in College Grading Systems: A Journal Symposium, Journal of Higher Education, 1964, 35, 89-91..

Heist, P. Personality Growth in the College Years, The College Board Review, 1965, 56, 25-32.

Holland, J. L. Creativity and Academic Performance Among Talented Adolescents, Journal of Educational Psychology, 1961, 52, 136-147.

Holland, J. L. Prediction of College Grades from Personality and Aptitude Variables, Journal of Educational Psychology, 1960, 51, 245-254.

Hoyt, D. P. The Relationship Between College Grades and Adult Achievement: A Review of the Literature, Research Reports, American College Testing Program, 1965, 7, i.

Jordan, D. S. The Trend of the American University. Stanford, Calif.: Stanford University Press, 1929.

Juola, A. E. Selection, Classification, and Placement of Students. In P. L. Dressel and Associates, Evaluation in Higher Education. Boston: Houghton Mifflin, 1961.

Kappel, F. R. From the World of College to the World of Work. New York: American Telephone and Telegraph Co., 1962.

Kelley, E. G. A study of Consistent Discrepancies Between Instructor Grades and Test Results, Journal of Educational Psychology, 1958, 49, 328-334.

Kirby, B. C. Three Error Sources in College Grades, Journal of Experimental Education, 1962, 31, 213-218.

Learned, W. S. The Wages of Scholarship, 36th Annual Report. Boston: Carnegie Foundation for the Advancement of Teaching, 1940-41, p. 55.

Maney, C. A. Sex Bias in College Marking, Journal of Higher Education, 1933, 4, 29-31.

Marshall, M. S. To Grade or Not to Grade, Journal of Higher Education, 1952, 23, 264-269.

Palmer, O. E. Evaluation of Communication Skills. In P. L. Dressel and Associates, Evaluation in Higher Education. Boston: Houghton Mifflin, 1961.

Perry, W. G., Jr. Examsmanship and the Liberal Arts: an Epistemological Inquiry. In L. Bramson (Ed.), Examining in Harvard College. Printed by Authority of the Committee on Educational Policy, Harvard Univ., 1963, Pp. 125-135.

Platz, A., McClintock, C., and Katz, D. Undergraduate Grades and the Miller Analogies Test as Predictors of Graduate Success, The American Psychologist, 1959, 14, 285-289.

Rogers, G. The Facilitation of Significant Learning. In L. Siegel (Ed.), Instruction: Some Contemporary Viewpoints, San Francisco: Chandler, in press.

Runes, D. D. Letters to My Teacher. New York: Philosophical Library, 1961. Quoted by T. C. Howard in his paper The Structure and Functions of Grades, Nasson College, 1964.

Saupe, J. L. Learning and Evaluating Processes. In P. L. Dressel and Associates, Evaluation in Higher Education, Boston: Houghton Mifflin, 1961.

Schwab, J. J. Eros and Education: A Discussion of One Aspect of Discussion, Journal of General Education, 1954, 8, 51-71.

Shaw, W. B. A Short History of the University of Michigan. Ann Arbor: Wahr, 1934.

Singer, J. E. The Use of Manipulative Strategies: Machiavellianism and Attractiveness, Sociometry, 1964, 27, 128-150.

Stark, R. Graduate Study at Berkeley: An Assessment of Attrition and Duration. Survey Research Center, Univ. of California, Berkeley, 1966.

Wright, Patricia S. Enrollment for Advanced Degrees (OE-54019-63, Circular No. 786). Washington: Office of Education, U. S. Department of Health, Education, and Welfare, 1965.